General Description

The WSF45P10 is the highest performance trench P-Ch MOSFET with extreme high cell density , which provide excellent R_{DSON} and gate charge for most of the small power switching and load switch applications.

The WSF45P10 meet the RoHS and Green Product requirement with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Green Device Available

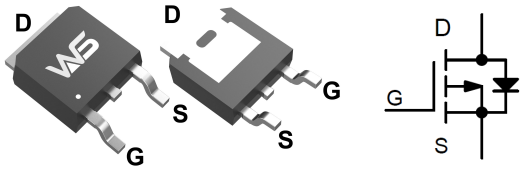
Product Summery

BV_{DSS}	R_{DSON}	I_D
-100V	44mΩ	-40A

Applications

- Inverters

TO-252 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		-100	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to 175	°C
I_S	Diode Continuous Forward Current	T_C=25°C	-40	A
Mounted on Large Heat Sink				
I_{DM}	Pulsed Drain Current *		-120**	A
I_D	Continuous Drain Current	T_C=25°C	-40	A
		T_C=100°C	-26	
P_D	Maximum Power Dissipation	T_C=25°C	136	W
		T_C=100°C	68	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.1	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	
Avalanche Ratings				
E_{AS}	Avalanche Energy, Single Pulsed	L=0.5mH	308***	mJ

Note：* Repetitive rating ; pulse width limiited by junction temperatur
** Drain current is limited by junction temperature
*** VD=-80V

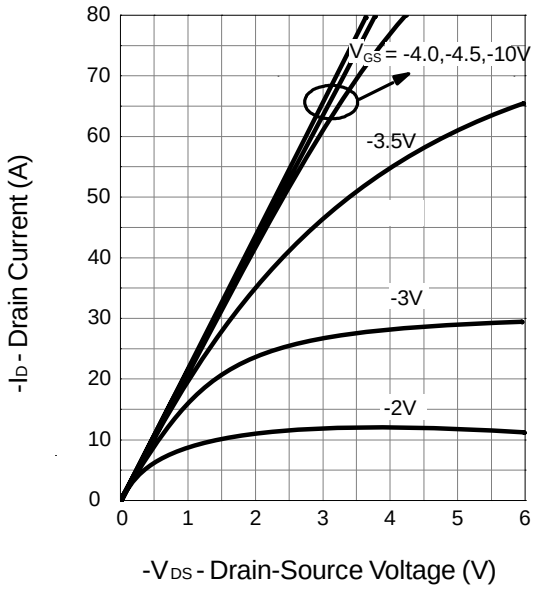
Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=-250μA	-100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-100 V, V_{GS}=0V	-	-	-1	μA
		T_J=85°C	-	-	-10	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=-250μA	-1	-2	-3	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$*	Drain-Source On-state Resistance	V_{GS}=-10V, I_{DS}=-20A	-	44	55	mΩ
$R_{DS(ON)}$*	Drain-Source On-state Resistance	V_{GS}=-4.5V, I_{DS}=-20A	-	47	58.5	mΩ
Diode Characteristics						
V_{SD}*	Diode Forward Voltage	I_{SD}=-20A, V_{GS}=0V	-	-0.8	-1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=-20A,dI_{SD}/dt=-100A/μs	-	70	-	ns
Q_{rr}	Reverse Recovery Charge		-	90	-	nC
Dynamic Characteristics						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	2	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-20V, Frequency=1.0MHz	-	5720	-	pF
C_{oss}	Output Capacitance		-	790	-	
C_{rss}	Reverse Transfer Capacitance		-	450	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-50V, R_G = 6 Ω, I_{DS} =-20A, V_{GS}=-10V,	-	30	-	ns
T_r	Turn-on Rise Time		-	79	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	82	-	
T_f	Turn-off Fall Time		-	69	-	
Gate Charge Characteristics						
Q_g	Total Gate Charge	V_{DS}=-80V,V_{GS}=-10V, I_{DS}=-20A	-	125	-	nC
Q_{gs}	Gate-Source Charge		-	21	-	
Q_{gd}	Gate-Drain Charge		-	45	-	

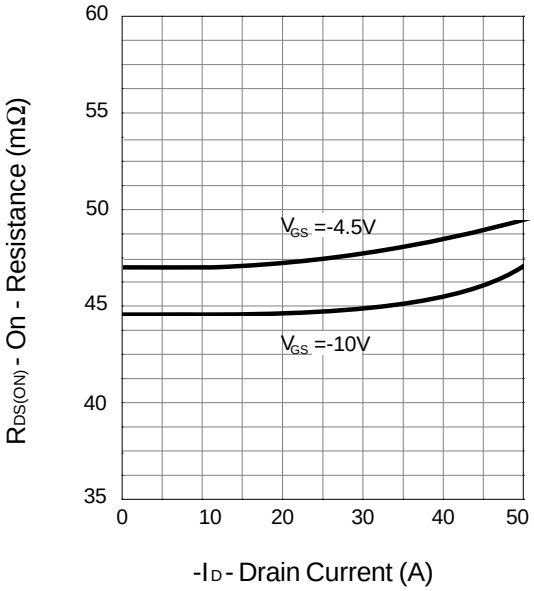
Note * : Pulse test ; pulse width ≤300μs, duty cycle≤2%.

Typical Characteristics

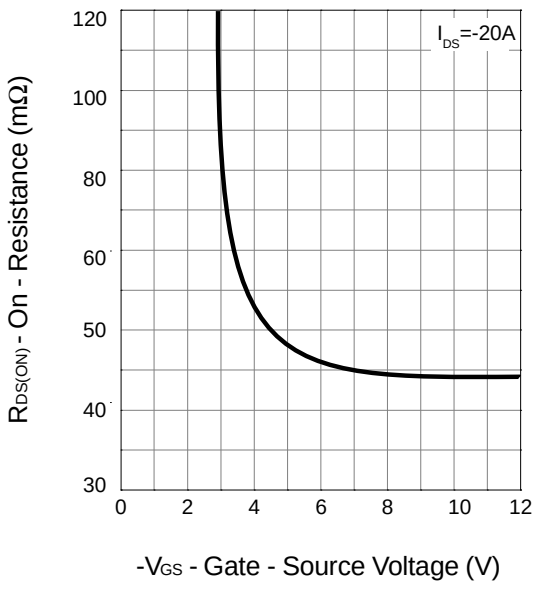
Output Characteristics



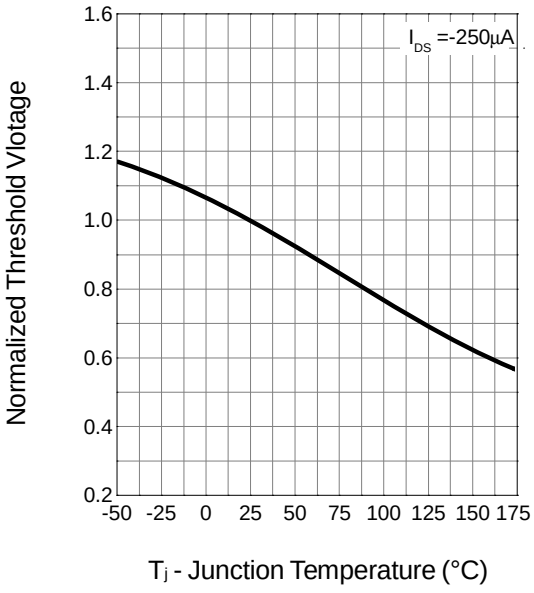
Drain-Source On Resistance



Drain-Source On Resistance

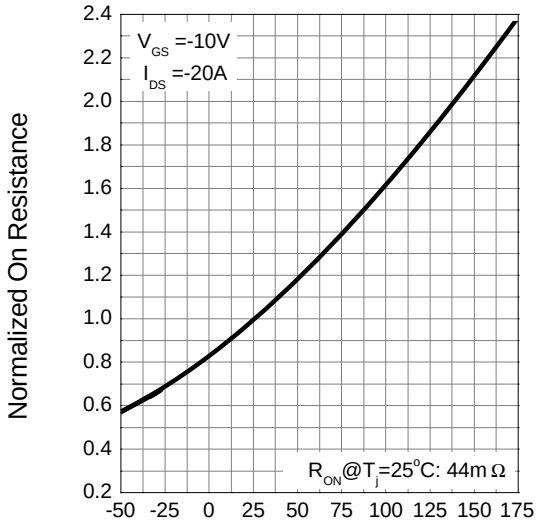


Gate Threshold Voltage

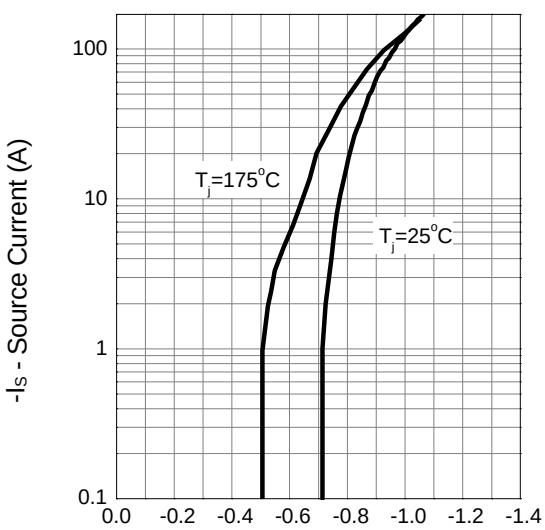


Typical Characteristics

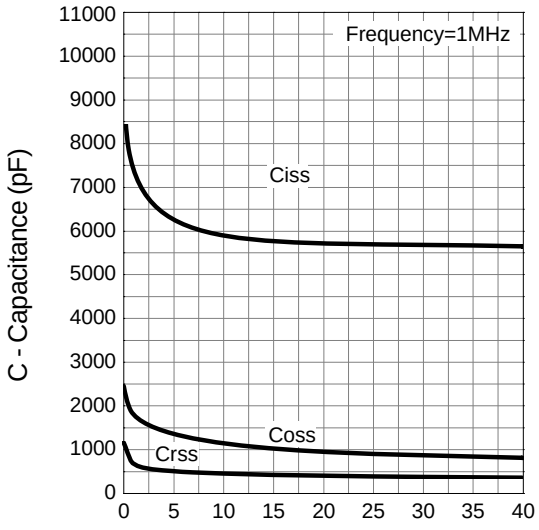
Drain-Source On Resistance



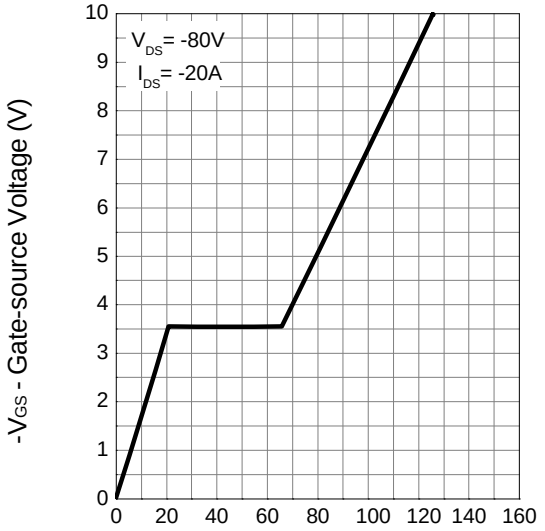
Source-Drain Diode Forward



Capacitance

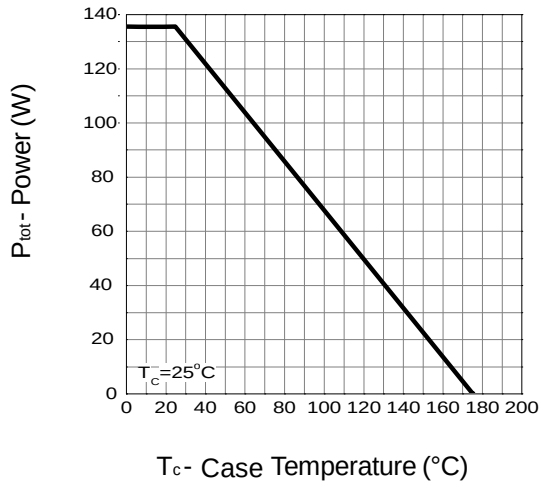


Gate Charge

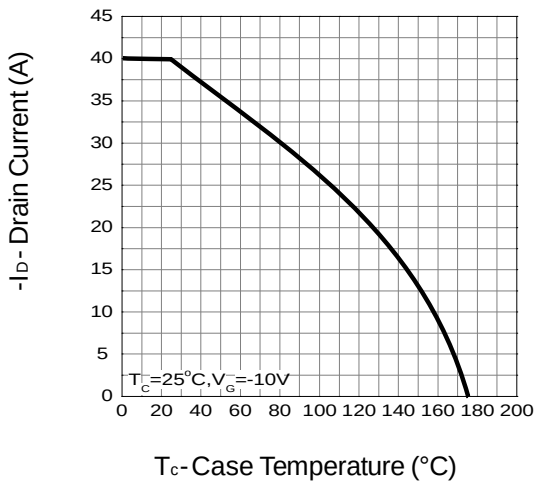


Typical Characteristics

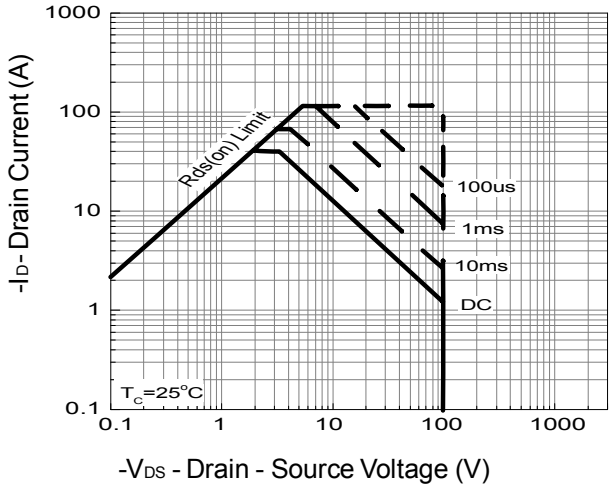
Power Dissipation



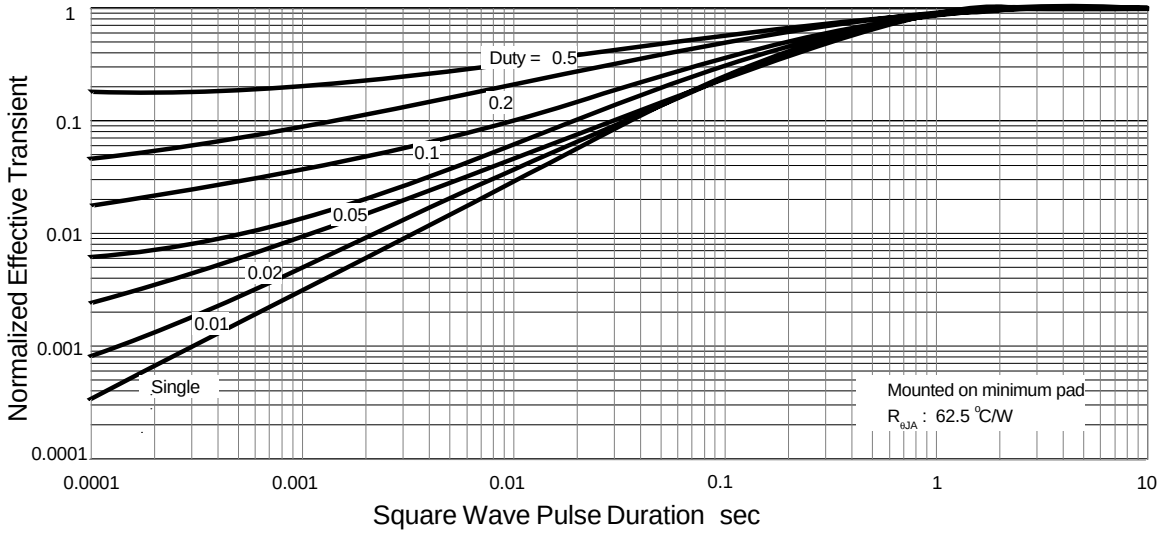
Drain Current



Safe Operation Area



Thermal Transient Impedance



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